

1. Solve the following equations algebraically for all values of x. Be sure to indicate any restrictions.

a. $\frac{x}{x-2} - \frac{8}{x+3} = \frac{10}{x^2+x-6}$

b. $\frac{9}{x} + \frac{9}{x-2} = 12$

c. $\frac{4}{x-1} = \frac{5}{2x-2} + \frac{3x}{4}$

d. $\frac{1}{2a} - \frac{9}{a^2+6a} = \frac{2-a}{2a+12}$

2. Solve each of the following graphically by:

- i. Draw a complete graph of the function showing all intercepts and asymptotes
- ii. Write the window settings you use on your graph
- iii. Find the solution set

a. $\frac{x-2}{x} = \frac{x+2}{2x}$

b. $\frac{x}{x+2} = \frac{3}{x} + \frac{4}{x^2+2x}$

c. $\frac{x}{2} = \frac{3}{2x+1}$

3. Solve each of the following graphically by:

- i. Draw a complete graph of the inequality showing all intercepts and asymptotes
- ii. Write the window settings you use on your graph
- iii. Draw a number line with critical points that show the values of x that satisfy the inequality
- iv. State the solution set using both set builder and interval notation

a. $\frac{x-1}{4} \geq \frac{8}{x+3}$

b. $\frac{x-3}{x+2} < 8$

c. $\frac{3}{x+1} + \frac{2}{x} < 6$

4. Solve the following systems of equations algebraically:

a.
$$\begin{aligned} 7x - 2y &= 14 \\ -3y + 7x &= 21 \end{aligned}$$

b.
$$\begin{aligned} -4x + 5y - 14 &= 0 \\ 8 + 4x &= 3y \end{aligned}$$

c.
$$\begin{aligned} 93 - a &= 4b \\ a + 4b &= 43 \end{aligned}$$

d.
$$\begin{aligned} 8x + 12y &= 48 \\ 6x + 9y &= 36 \end{aligned}$$

e.
$$\begin{aligned} 4x - 5y &= -6 \\ -3y - 2 &= -x \end{aligned}$$